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| **Unit 2**  ***Oct 15-Nov 7***  ***(16 days)*** | Understanding of Decimal Place Value | | | | | |
| [*Standards, Rationale, Strategies, and Misconceptions*](http://lrsd5thgrade.wikispaces.com/file/view/Unit+2+Standards%2C+Rationales%2C+Strategies%2C+and+Misconceptions.pdf) | | | | | |
| WORKSHOP MODEL OF INSTRUCTION | | | | | | |
| **Warm Ups** |  | **WORKTIME Lessons** | | |  | **CLOSURE** |
| Give students large numbers to practice reading. This website is great for use on the SMARTboard   * <http://www.mathcats.com/explore/reallybignumbers.html> * All number talks should start with an estimate. * Estimation with Decimals See the websites below for the various strategies for estimating decimal products, quotients, sums, and differences; Implementation is the same as a number talk but maybe just do one or two a day. * Harcourt, Chapter 3, p. 50, has a page of problems that can be used to **estimate addition and subtraction**. * Important: the focus is estimation NOT finding the actual. The focus is estimation and the structure for computing, the why! * Students round to whole numbers in most cases. * **Estimating Products** * <http://www.mathgoodies.com/lessons/decimals_part2/estimate_products.html> | |  |  |  | | --- | --- | --- | | **Scaffolding Lesson (SL)** | **Constructing Lesson (CL)** | **Exercises (E)** | | A lesson that builds or recalls the prerequisite knowledge for the standard | A lesson to construct understanding of the standard through a deep/rich problem-solving task (usually contextual) | Games or activities that reinforce and deepen understanding of the standard to the point of mastery |   [5.NBT.1 5.NBT.2 5.NBT.3 5.NBT.4](http://lrsd5thgrade.wikispaces.com/file/view/Unit+2+Standards%2C+Rationales%2C+Strategies%2C+and+Misconceptions.pdf)  **Pre-Assessment for Units 2 and 3**  Lesson 1 **(SL/ CL)**  Adapted from Extending Children’s Mathematics, by Susan Empson  **Decimal problem-types – powers of 10**  Focus on structure and what is happening with the number when dividing by a power of 10. Students must explain and justify.   * Ms. Gomez has 359 dollars. She wants to use this money to buy teddy bears for the children’s hospital. If each teddy bear costs 10 dollars, how many teddy bears could she buy? (258, 10) (1263, 100) * The pencil factory makes 3,875 pencils a day. They put the pencils into boxes with 10 pencils in each box. How many boxes of pencils do they make in one day? (3,875, 100) (10,500, 100)   Lesson 2 **(SL/ CL)**  From Lessons from Decimals and Percents, By De Francisco and Burns  **Representing decimal numbers and patterns.**  Written symbols and numbers need to be corresponded to the models. Relate to whole number system and fractions for tenths and hundredths. Discover the symmetry of the system by looking at adjacent places.  [Representing Decimals with Base 10 Blocks, pp. 1-8](http://www.lrsd.org/files/edservices/5xmRepresentingDecimalswithBase10Blocks.pdf)  (example of graphic organizer to use)<http://www.k-5mathteachingresources.com/support-files/representingdecimalswithbase105.nbt3.pdf>  Lesson 3 **(CL)**  Adapted from Extending Children’s Mathematics, by Susan Empson  **Decimal problem-types – powers of 10**  Focus on structure and what is happening with the number when dividing by a power of 10. Students must explain and justify based on strategies they create. (They may use repeated subtraction or group tenths together. Analyze the similarities and differences with whole number operations. Make connections between their understanding of fraction notation for tenths and hundredths and the decimal notation. What is happening to the decimal? How many tenths make one?   * An animal at the zoo eats \_\_\_\_\_\_ pounds of food each day. How many days will it take this animal to eat \_\_\_\_\_ pounds of food?   (10, 78) (10, 374) ( , 6 ) ( , 56 ) ( , ) ( , )  Lesson 4 **(CL)** will later become exercises  From Lessons from Decimals and Percents, By De Francisco and Burns  **Decimals and decimal notations**  More opportunity for students to think about decimals and decimal notation in a problem-solving, gaming format.  [Decimal Riddles, pp. 21-26](http://www.lrsd.org/files/edservices/5xmDecimalRiddles.pdf)  Lesson 5 **(CL/E)**  Adapted from Extending Children’s Mathematics, by Susan Empson  **Decimal problem-types – powers of 10**  Focus on structure and what is happening with the number when dividing by a power of 10. Students must explain and justify. What is happening to the decimal? Will this happen every time?   * Julie has six huge candy bars. If she eats candy bar each day, how long will these six huge candy bars last?   (12) ( , 24)   * The bakery has 58 pounds of frosting. It takes pound of frosting to frost a cupcake. How many cupcakes could the bakery frost with the frosting they have?   Lesson 6 **(CL)**  Adapted from Georgia Department of EducationCommon Core Georgia Performance Standards Framework *Fifth Grade Mathematics* • *Unit 3*  Students will continue to deepen their understanding of multiplication and division and the powers of 10. What are the patterns? Students should record their work in their student notebooks for easy reference. Students should make predictions first and then check. Calculators may be used to check predictions.  [Understanding Powers of 10](http://lrsd5thgrade.wikispaces.com/file/view/Understanding+the+Pattern+for+Powers+of+10.pdf)  Lesson 7 **(CL)**  Adapted from Extending Children’s Mathematics, by Susan Empson  **Open Number Sentences**  Focus is on justifying what occurs with powers of 10. Students should reason using fractions, manipulatives, etc. They must explain how they know. Example for “a”: “I know that 10 tenths is 1, so *k* = 10”  Directions: Ask students to work the problems in order. Have base 10 available for those who need it. Have students pair-up to discuss their strategies. Listen for students using relational thinking. Ask student pairs to share their strategies with the whole class.   1. *k* **x** 0.1 = 1 2. *m* **x** 0.1 = 3 3. *j* **x** 0.1 = 30 4. y **x** 0.1 = 300 5. r **x** 0.01 = 3 6. j **x** 0.01 = 30 7. s **x** .01 = 300 8. r **x** 0.01 = 43 9. a **x** 0.01 = 43   Lesson 8 **(CL to become E)**  **Practice for reading, writing, and interpreting decimal numbers. Two games are introduced. Pull back small groups for students who need more support.**  **The Place Value Game**  You need: a partner or small group, a die, or 0-9 spinner, or number cards 1-9  The goal of this game is to make the largest number possible. Each player writes it in one space on his or her game board.  \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ . \_\_\_\_\_ \_\_\_\_\_  Players take turns rolling the die, spinning the spinner, or choosing a number card. Each time a number comes up, every player writes it in one space on his or her game board. Once written, the number cannot be moved. The winner has to have the largest or smallest number (depending on what you decide) and must be able to read it.  *Extension:* Both partners need to write the number in expanded form and figure the difference.  *AND from Investigations, Building on Number You Know*  [**How to Play Smaller to Larger**](http://lrsd5thgrade.wikispaces.com/file/view/How+to+Play+Smaller+to+Larger.pdf)[**Decimal Cards**](http://lrsd5thgrade.wikispaces.com/file/view/Decimal+Cards+A+and+B.pdf)  Lesson 9 **(E)**  Adapted from Extending Children’s Mathematics, by Susan Empson  **Decimal problem-types – powers of 10**  Focus on structure and what is happening with the number when dividing by a power of 10. Students must explain and justify. What is happening to the decimal? Will this happen every time?   * Mrs. Jones has 237 dollars. She wants to use this money to buy books to donate to the children’s hospital. If each book costs 10 dollars, how many books could he buy?   (523, 10) (25, 0.10 ….change the books to used comic books and change the person to a student) (110, 0.10)   * Henry uses 1/10package of cinnamon in each batch of cinnamon cookies he makes. If Henry has 3 and 1/10packages of cinnamon, how many batches of cookies can he make? (Make sure to relate the fractions to decimal notation.).   Lesson 10 **(E/CL)**  Adapted from Georgia Department of EducationCommon Core Georgia May 2012  [**Yahtzee Game Powers of 10**](http://lrsd5thgrade.wikispaces.com/file/view/Powers+of+10+Yahtzee.pdf)  Student will gain practice with understanding the social knowledge of the written powers and their value. Be sure to read the misconceptions attached with this game.  Lesson 11 **(CL/E)**  Adapted from Extending Children’s Mathematics, by Susan Empson  **Practice with equations and powers of 10. Ask students to find at least 3 solutions to each problem, more if possible.**   1. *a*  x 10 + *b* = 53 2. 832 = *a x 100 + b x 10 + g* 3. 874 = *b*  x 10 + c 4. 874 = *c*  x 100 + *b* x 10   Lesson 12 **(E/CL)**  Adapted from Extending Children’s Mathematics, by Susan Empson  **Problem Solving – focus on the properties and operations used in student strategies**  Students should use precise language when discussing place value.   * Karl has \_\_\_\_\_ boxes of candy with \_\_\_\_\_\_ pounds of candy in each box. How many pounds of candy does Karl have? (4, 10) (57, 10) (4, 0.1) (57, 0.1) (364, 0.1)   Lesson 13 **(E/CL)**  Adapted from Extending Children’s Mathematics, by Susan Empson  **Problem Solving – focus on the properties and operations used in student strategies**  Students should use precise language when discussing place value.   * My pet eats \_\_\_\_ jars of applesauce each day. How many days would it take my pet to eat \_\_\_ jars of applesauce? (10, 56) (0.1, 8) (0.1, 23.4)   Lesson 14 **(E)**  **Exercises/Practice/Small groups**  Work Stations and Menus – 2 days – Students continue to play games and work on tasks to solidify their understanding of decimal place value and the powers of 10. This is an ideal time to flexibly group students according to their needs.  **Interim Assessment**  Students take 10 question interim assessment. Implement using the workshop model. Students work individually. Grade assessment the same day, in class, to give immediate feedback. Students justify and defend their solutions. | | | [ARTICLE](http://lrsd5thgrade.wikispaces.com/file/view/CBS_Communication_Mathematics.pdf) – gives a description of each of the following   * **Gallery walk** * **Math Congress** * **Discussion and**   **Communication**  **during the closure**   * **Summarizing**   Article: [Generating](http://lrsd5thgrade.wikispaces.com/file/view/how_to_get_students_talking.pdf)  [Math Talk](http://lrsd5thgrade.wikispaces.com/file/view/how_to_get_students_talking.pdf) (from Math  Solutions)  **Math**  **Notebook/Journal**  Students should keep  a record of all their  work in a composition  book, preferably one  with graph paper.  Each day the journal  or notebook should  be dated. All notes  and all work should be  recorded in this book.  After each lesson  during the last 5  minutes students  should reflect using  these prompts like the  following:   1. Today I learned: 2. This   connects/adds to  what I know about:   1. What I learned   today can help  me later when:  The journal continues to serve as an important formative assessment tool to drive instruction on a daily basis – including partnering, small group, and numbers used in problems. |
| **ASSESSMENT** | | **ESSENTIAL QUESTIONS**   * How are decimal numbers placed on a number line? * How can we use estimation to help us check the reasonableness of decimal computation? * What models help us make sense of decimal values? * How do we solve problems with decimals? * How does the location of digit in the number affect the size of a number? * What are the various uses of decimals? * How are decimals and fractions the same? * What happens when we multiply decimals by powers of 10? * How can we use exponents to represent the value of larger numbers? * How can we describe the relationship between the number of zeroes and the exponent for base ten? | **VOCABULARY**   * decimal * digit * fraction * decimal point * hundred thousands * hundreds * hundredths * millions * ones * place value * ten thousands * tens * tenths * thousands | **INTERVENTIONS**   Use the same problem stems in the lesson but make the numbers easier. Make sure students explain the math using base 10 blocks and the number line. | **HOMEWORK IDEAS**  Give students different numbers for the same problem-solving stem. For example, for lesson 5, just change the numbers.  Give students a problem similar to lesson 1. Change the numbers. Students find 3 solutions  Have students play the Place Value Game at home and keep the record sheet. Student records in his/her journal what happened during the game. What strategy did he/she use to win? | |